SURGICAL PROGRESS.*

GENERAL SURGERY, PATHOLOGY AND THERAPY.

I. Operative Interference in Embolism of the Pulmonary Artery.

F. TRENDELENBURG, of Leipzig, said the first thing to be considered was whether those conditions could be fulfilled, with regard to operative interference in cases of emboli of the pulmonary artery, which would justify the application of surgery; that is to say, whether the diagnosis of embolism can be ascertained with sufficient accuracy and whether there is sufficient time for an operation.

The first question, he concludes, can be answered in the affirmative, although, individually, the symptomatology is complex, in their entirety they give a certain characteristic picture; usually the well-known symptom-complex of sudden collapse, pallor, lividity of the lips, loss of pulse, together with deep and distressed respiration. Generally the diagnosis will be strengthened by minor indications, either through a previous operation in which the larger veins were exposed or ligated, or because of an evident thrombosis of the femoral or other veins, or by fracture of one of the lower extremities, or by varicosities. Auscultation of the heart generally gives a negative result; systolic, or systolic and diastolic murmurs may be interpreted as an evidence of the fact that the embolism is in the right heart.

With regard to the second question, he states that death by no means results as suddenly as is generally supposed. In reviewing nine cases of embolism occurring in the Leipzig Hospital, he found that only two succumbed very suddenly,—in from one to two minutes. In the other seven cases, an interval varying from ten minutes to an hour elapsed before the patients died; with at least one-half of the cases it was found that as much as fifteen minutes would have been at the disposal of the operator, that is to say, enough time for an operation in a hospital.

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The technic of the operation was demonstrated on a corpse, and corresponds to the technic given in the *Zentralblatt* No. LV, 1908. Briefly stated, the facts are that the pulmonary artery lies in the second left intercostal space and is covered by the pericardium, and behind it lies the superior vena cava. Experimentally, he has established the facts that complete compression of the pulmonary artery can only be tolerated, at the longest, forty-five seconds to two minutes, beyond that, death occurs. Partial compression, is possible, for several minutes. Compression of the superior vena cava can be borne for at least ten minutes, according to Sauerbruch. Presumably the venous plexus of the heart supplies the right heart and the lesser circulation with blood when the vena cava is compressed; while, on the other hand, when the pulmonary artery is compressed, all blood is cut off from the lungs. Simultaneous compression of the pulmonary artery and aorta has the same effect as that produced by compression of the pulmonary artery alone.

It is, therefore, necessary that the emboli be extracted as soon as possible after the compression and incision of the pulmonary artery; forty-five seconds should suffice for such a simple procedure. There is, however, no objection to compressing the artery laterally if one needs more time, then to release the pressure and allow the circulation to be resumed; then recompress, and continue the search for the branches of the pulmonary artery which contain the emboli.

A transverse incision on the second rib, and a vertical incision on the left side of the sternum, are to be preferred to the flap incision for opening the thorax. The part of the second rib adjacent to the sternum is resected for 10 to 12 cm., a vertical incision is made through the pleura and into the pericardium at the level of the third rib. The vessels here lie a little underneath the sternum, they are pulled forward and a rubber tube is passed behind the aorta and the pulmonary artery, and afterwards drawn upon. After this procedure rapidity is essential; incise the pulmonary artery, pull out the embolus with a pair of forceps, and immediately close the incision in the arterial wall with clamps, and, as before stated, using no more than forty-five seconds. The compression is then removed, and one can suture the artery and the soft parts at leisure.

Trendelenburg, in referring to a previously published article —in reference to a calf which was killed four months after the removal of an embolus 15 cm. long from its pulmonary artery—showed the specimen of the heart; on the inner side of the pulmonary artery the place of the incision could be easily recognized by a thickening and callousness on the intima; the silk threads which were included could not be discovered from the outside as they had been covered over by hyperplastic tissue. An attempt to apply this operation to a man seventy years of age was not successful, owing to death on the table. Since then he reports two cases which had been operated on in the surgical clinic at Leipzig (*Deutsche Zeitschrift für Chirurgie,* vol. xciii., p. 282; and *Deutsche Wochenschrift,* No. xxvii, 1908) both of which cases proved the feasibility of this operation on man. The two patients, who had become pulseless during the operation, revived quickly after the extraction of the pieces of thrombus from the pulmonary artery, some of which were 34 cm. in length; the loss of blood from the artery itself was very small. The first patient, however, died fifteen hours after the operation from heart failure. The second patient, also, died from a post-operative hemorrhage from the internal mammary artery, but survived his operation for thirty-seven hours. In a branch of the pulmonary artery an overlooked embolus was found, post mortem.

II. Shortening the Treatment of Patients Subjected to Laparotomy, by Allowing Them out of Bed Early.

KÜMMELL, of Hamburg, after a historical review of the methods heretofore used, pertinent to allowing persons who have undergone operations, particularly those who have been subjected to laparotomy, to leave their beds earlier than is customary, discusses his experiences.

Since January, 1908, he has observed 164 patients who had left their beds on the first to the third day after the operation: of these there were fifty herniotomies; eight Alexander Adams's; fifty-six appendectomies à froid; twenty appendectomies à chaud; seven extirpations of ovarian cysts; four myomectomies; salpingectomies (pyo-salpinx, ectopic gestations); three cholecystectomies; four entero-anastomoses; gastro-enterostomies, and exploratory incisions. The reason for diverging from the previous methods of having persons after being subjected to laparotomy keep to their beds for two to three weeks, was the experience of others that the chances of emboli are considerably diminished when as normal a condition as possible is brought about by having patients sit up as soon as possible after the operation, and allowing the action of the heart and other organs to correspond as nearly as possible to normal conditions. As a matter of fact, the experience of operators in this domain has demonstrated a considerable diminution of embolic and thrombic sequelæ.

Among the 164 cases which Kümmell considers, there is only one unimportant thrombosis and no embolic occurrences; while according to the old method, in the year 1906–7, with almost the same number of laparotomies, that is, 600, about one per cent. of these died from the effects of thrombosis and embolism. The author sees an advantage in the new method that is not to be underestimated, viz., that the wounds heal more firmly than might usually be expected.

As a pre-requisite to the application of this method, Kümmell designates:

1. Perfect anæsthesia, without vomiting or other complications.
2. Quick operation; small loss of blood.
3. Primary union.
4. Firm suture of the fascial planes.

In this case, as in every other one of such eminent importance, judgment must be used, and adherence to one procedure for everything avoided. And here the valuation of the idiosyncrasies of the patient must be taken into consideration. He has not recorded, so far, any failures by this method, on the contrary, it has proved itself efficacious (*a*) in that it diminishes the symptoms of disturbed intestinal activity which are so often disagreeable after laparotomy; (*b*) in that the subjective condition of the patient is ameliorated; (*c*) in that it promotes the recuperative powers; briefly, then, that it shortens the length of convalescence, and, above all, leads to a firmer cicatrization.

III. The Spark Treatment of Cancer.

V. Czerny, of Heidelberg, remarks that four-fifths of his patients are suffering from inoperable carcinoma. For this reason the method of treatment as suggested by Keating Hart was used as a last resort. The apparatus can be joined to the Röntgen coils, of which one uses the inductor and Wehnelt current interrupter. The electricity is conducted to a petroleum condenser which is fitted with spark and solenoid interrupters; the latter being in connection with the Oudin resonator; a copper spiral of 130 turns which by means of a lever controller, is so attuned to the solenoid that from its upper pole through a metal electrode, sheafs of sparks of 10 to 20 cm. in length will be emitted. These sheafs of sparks, which are cooled in a stream of carbon dioxide or compressed air, are directed from five to forty minutes on the carcinoma and its vicinity in various directions, while the patient is in deep narcosis.

Then the carcinoma is extirpated or curetted, the hard border cut off with a knife, and the surface again subjected to the sparks for ten to fifteen minutes, in order to destroy the remaining carcinomatous nests. The action of the spark discharges seems to cause a destruction of the carcinoma cells and also of the intervening tissue if it is soft; tough scirrhus tissue or healthy skin resists long exposure, but are eventually changed to a burnt scab.

Deep-seated carcinomas are best extirpated by the usual surgical procedures, and the surface then subjected to the sparks. Especially when the first operation is for recurrence, or if the condition of the tumor makes recurrence likely. There is a good deal of subsequent secretion from the surfaces so treated, and the parts must be well drained or treated openly with tampons.

Czerny reports from November, 1907, to April, 1908, 120 such treatments. The fulgurations were used on fifty-nine patients; of these, four were sarcomas, in which one may naturally expect better results than in carcinoma; the results of the latter can not as yet, of course, be permanently stated. But of these cases several are improving; seventeen have died; eight facial carcinomas have been cured; some have had relapses into their former condition after short periods of improvement. The treatment seems to be most useful in the superficially ulcerated, and particularly in the soft carcinomas. It stimulates rapid cicatrization and granulation, and is certainly more efficacious than the Röntgen ray or radium, although they should not be neglected as accessories.

IV. Remarks Concerning the Technic of Transplanting the Thyroid Gland.

Kocher, of Bern, reports on several successful cases of attempts to graft thyroid tissue onto bone (the tibia), a process which obtains just as certain results and is simpler and less dangerous of execution than, for instance, the former procedure of transplanting into the spleen.

In discussion of the above paper, Payr, of Greifswald, states the further course of the case of thyroid transplantation into the spleen, referred to two years ago in the Surgical Congress. Since the operation, twenty-eight months have passed, a period which suffices to allow formation of a judgment on the result of the transplantation into that organ.

It had been a very unfavorable case, in which the speaker had transplanted a large piece of maternal gland into the spleen; the child had for three years previously been treated internally with various thyroid preparations, with little success. In spite of the lack of results in this former treatment, after the transplantation, the intellectual and somatic condition of the child had improved in a remarkable degree during the first months and to the end of the first year; after that, somewhat more slowly. With regard to the intellectual condition of the patient, Payr reports that the child was totally imbecile and animal-like in its entire disposition; it could neither stand, walk nor sit, it emitted inarticulate sounds and did not react to sensory impressions. All these symptoms improved remarkably. Growth and increase of weight were very evident. The X-rays were not used to observe the epiphyseal growth, on account of the injurious effect which they have on young bones. The child, since the fall of 1907, has not progressed much and has suffered repeatedly from intense catarrhal conditions; it has become very anemic and sallow and has developed a general glandular enlargement, including the spleen. The increase in weight has also dropped off, but the child now weighs 19,400 grammes (average weight of a child of eight years); the dentition, growth of hair, and nail development are all normal, and the skin shows no evidence of the former myxodermatic changes. The position and carriage are not absolutely straight and the gait, in the last two months, has become spastic.

The later results have not come up to the promise given by the improvement in the earlier months; it is certain, however, that the child has shown no recurrence of its myxœdema, and we must deduce, therefore, that the gland transplantation is still in a viable condition. There were also many factors gravitating against the best interests of the child; that is, poor lodging, poor nourishment, bad air, light and care; the result, therefore, can not be considered a complete one. With our present-day knowledge it is probably of prime importance in which kind of case of hypothyreosis operation is performed; whether it be a case of congenital or acquired myxœdema, or cachexia strumipriva, or, finally, of a combination of cretinism with myxœdema. We know from the recent investigations of Scholz and Zingerle that in cases of cretinism important changes are evidenced in the central nervous system, especially in the cerebrum, and these are present in almost every case. In the combined cases of congenital myxœdema and cretinism, particularly in cases of somewhat older children, the chances of success of transplantation are, therefore, probably, very limited, because it seems doubtful if the cerebral defects caused by the lack of thyroid extract are capable of being reconstructed. The more recent the case, the better the success.

With reference to the technic, the spleen is especially adapted to receive the transplantation because of its highly developed vascularization. If it become evident that the marrow takes care of the nourishment of the transplanted tissue in the same way, then of course this method would prove much simpler and less dangerous.

GARRÉ (Bonn) transplanted, in a case of chronic tetany after goitre extirpation, a parathyroid which he had removed from a case of Basedow's, into the tibia, with marked improvement in the symptoms, but suggests that we should transplant entire organs by means of the vascular suture (Stich), if permanent results are to be obtained. This has been accomplished experimentally.

CZERNY (Heidelberg) extirpated an entire carcinomatous gland, and transplanted for the resultant tetany a fresh piece of gland in the spleen, with immediate improvement of the symptoms. On autopsy, death having occurred from pneumonia on the sixth day, the thyroid implantation was found to be perfectly healed into the gland substance.

Muller (Rostock), in two cases of cretinism, has made transplantations into the tibia, with marked intellectual improvement. Eiselsberg also reports two successful cases by this method, which had resisted all other procedure; and one other, in which he had not been successful because of suppuration.

V. Use of Free Bone Plastic and Attempts at Bone Transplantation.

Lexer, of Königsberg, i. Pr., reports on his experiences with free bone transplantation based on many cases. Those treated consist of replacing large gaps in the skull, of lifting sunken portions of the facial skeleton, replacing large defects in the long bones and the lower maxilla, cure of pseudo-arthrosis including cases of neck of the femur, the bolting of bones, the stiffening of paralytic joints especially in the foot, of bolting adjacent bones including the head of a joint or including both epiphyses, and, finally, the transplantation of entire joints. Formerly he used boiled and macerated bone and transplanted it underneath the periosteum; this was successful in small defects but not in large ones, the bone being usually extruded by suppuration.

In the cases now considered, he has been using material gathered from the abundant amputations of his clinic, for transplantations. For this purpose he finds the fresh bone covered with periosteum best suited, while the old process served in most instances only where the bone had been transplanted under the periosteum into the bone itself in the case of large pieces to replace defects in the long bones. As the marrow in the transplanted bone causes an inflammatory action accompanied by fever resultant from its destruction, he now clears this out and fills in the cavity with iodoform, by which means this inflammatory phenomenon of resorption has been obviated. The gradual absorption of the filling is easily checked up by means of the X-ray and thus the continuation of the vascularization observed.

Of interest in his report is a case in which for sarcoma of the upper third of the tibia, a transplantation was made to supply the defect caused by amputation including one-third of the bone together with its articular surface. The result healed in and a relatively good functional joint was obtained. A similar case is noted in the resection of the upper end of the humerus.

Again, in a case of bony ankylosis of the knee, he substituted, after a section of the joint, an entire fresh knee-joint with cartilages and crucial ligaments, measuring from one to one-and-a-half cms. on either side of the joint's surface. Seven months after the operation he reports that slight movement has resulted, and remarks that it was problematical whether good movement could ever be obtained.

VI. A New Method for Local Anæsthesia in the Extremities.

A. Bier (Berlin) suggests that in order to perform operations on limbs which have heretofore been impossible to do without pain, under local anæsthesia, that the part to be anæsthetized should be isolated between two rubber bandages, one above and one below the part to be operated on, and should be spread over as large an area as possible without encroaching on the field. This is painless in contradistinction to the ordinary Esmarch operation. In the isolated part a vein is then picked up as close as possible to the proximal bandage; in the leg, the saphenous; in the arm, the cephalic, basilic or median. For the fore-arm the large superficial veins may be used. The procedure subsequently is similar to that used for an infusion; he injects between fifty and eighty c.c. of a 0.25 per cent. or 0.5 per cent. novocain. The part immediately becomes anæsthetic if the technic has been successful.

The anæsthesia is to be divided into two parts; first, the direct and immediate anæsthesia; and, second, the later or indirect anæsthesia, viz., one which occurs below the distal bandage; the operation should be done in the first stage. Soon after the second stage motor paralysis will be evidenced. Under this procedure the author has painlessly resected elbow and knee joints, done various amputations, sequestrotomies, and tendon implantations. Poisoning is avoided because of the artificial anemia produced, and owing to the constriction the novocain does not get into the circulation, and also because of its dilute solution. It is further obviated by first loosening the proximal bandage lightly to allow a primary circulation of the arterial blood, the venous returns still in check, in order that the wound may so be washed out. The bandage is then tightened and is not loosened again until the end of the operation. Finally, the vein may be washed out through the cannula, with a physiological salt solution. The anæsthesia disappears immediately on loosening the proximal bandage.

HEAD.

I. The Operative Cure of Acromegaly by Removal of a Hypophysial Tumor.

J. Hochenegg (Wien) reports the case of a patient thirty years old, in whom, on account of the very evident symptoms in conjunction with a Röntgen ray photograph of the skull, a diagnosis of acromegaly and tumor of the hypophysis was made. The acromegalic changes involved the head, face, hands and feet; the superior incisors were separated about half an inch; the disease itself seeming to have developed in two distinct parts. The patient remained normal up to the fifteenth year; between the ages of fifteen and twenty-five she became pale, suffered from intense headache, periodic attacks of perspiration, nose-bleed and cessation of menses. There soon developed a defect in the sight. After one year these symptoms disappeared, the menses returned and continued for four years, when they again became scanty in August, 1907; the headache returned, and under parasthesia, enlargement of the hands and feet developed together with marked thickening of the lips, nose and tongue. The changes in the general disposition of the patient became so evident as to be easily recognized by her friends. The method used consisted in turning back the nose and reaming out the entire nasal cavity, until the apex of the cone so formed was situated at the bed of the hypophysis, after the method of Eiselsberg, Schlofer and Tandler.

The case further demonstrated that in acromegalic conditions the sinuses of the face, especially the frontal sinus, are very much enlarged, thus giving more room superiorly, if it be opened and cleared out in the course of the operation. On account of the subsequent defect in the anterior wall, two incisions were made in the line of the eyebrows, the bone chiselled through and then fractured, but not removed. The pharynx was tamponed in the posterior nares, the wall of the sinus of Highmore and the internal orbital plate were left intact, the hemorrhage checked by tampons of adrenalin. On the final chiselling through of the sella turcica, a tumor—white and tense, the size of a hazel-nut—appeared at the apex of the cone; the dura was split, and the real tumor which then appeared soft and reddish-brown, swelled out into the wound under pulsation.

The growth was curetted until only the tough dura lining the cavity was felt; the cavity was then wiped out with adrenalin tampons. This was all done through an aperture about the size of a pea; this is a very good procedure as the danger of subsequent meningitis is minified. The cavity was lightly tamponed with an iodoform wick, and iodoform gauze was gently packed into the nasal cavity through which the iodoform wick was led. The post-operative course was easy and free from complication. The drains were removed on the eighth day, and on the tenth day the patient was allowed up. Pathological diagnosis, adenoma of hypophysis.

The results are to be viewed from two separate aspects:

1. The headache stopped; the psychic condition immediately improved; the eyesight was much better. These three considerations can be looked at as the result of mechanical pressure; similar effects have also been obtained by other operators.

2. The greatest result, and the most remarkable, was the effect on the acromegalic condition; five days, post-operative, the patient subjectively remarked that the incisor teeth were approaching each other, that her jaws set differently; on the tenth day this change was very marked, and the hands were markedly diminished in size. One month later the patient was discharged. The foregoing signs had continued to improve, her feet had become greatly reduced in size, and her entire appearance was so changed that she was unrecognizable.

The divergent views on the importance and relation of hypophysial tumors with regard to their effect on the symptom-complex of acromegaly are interesting.

I. Hypophysial tumor is a partial phase of acromegaly, and is only one of the evidences of general enlargement.

II. Hypophysial tumor is the cause of the acromegaly, through the cessation of function of the hypophysis, or through the increased function of the hypophysis, or through the qualitatively changed secretion.

III. Hypophysial changes have a causal importance, but only for changes within the region of the head as being the part of the body connected with the cranial nerves.

The author's case, which he states is the first in which the operation was successful, may decide the question in particular, which influences are to be ascribed to hypophysial tumor in the genesis of acromegaly. The operation, however, viewed in the light of nothing but an experiment, seems to prove conclusively that hypophysial tumors have not only symptomatic but also etiological importance. It also proves that the acromegalic phenomena are caused not by a cessation of the hypophysial function but by a hyperfunction of the cerebral appendage, and proves further that the changes in the extremities are due absolutely to the hypophysial secretion.

H. BORCHARDT (Berlin) demonstrated a young man operated upon two months before for tumor of the hypophysis, exhibiting the symptoms of violent headache and visual disorders. The operation was done primarily through the frontal sinus, but while on lifting the frontal lobes the hypophysis could be reached, it was inaccessible to operation, and was accompanied by an alarming hemorrhage. A secondary operation was done through the nose and a partial resection of the tumor was accomplished, with the result that the headaches have stopped, and the maniacal attacks from which the patient had occasionally suffered have been relieved.

VON EISELSBERG (Wien) reports three cases operated on in January, 1907. The first case was a man twenty years old, who was operated on for a symptom-complex of headache, double hemianopsia temporalis, adiposity and defective development of the genitals. The X-ray gave a shadow of a tumor of the hypophysis. Operation, January 21, showed a cyst in the situation of the hypophysis, the pathological examination of which indicated an epithelial carcinoma. Result; the headache ceased, visual disorders were diminished, tendency toward corpulency inhibited, and at present the patient feels perfectly well.

The second case was a patient thirty-three years old; typical acromegaly. Eight years ago, while pregnant, noticed enlargement of hands, feet and face; had previously suffered from headache and visual disturbances. X-ray showed a considerable enlargement of the sella turcica, in addition to which there was considerable enlargement of the lymphatic glands, and a chronic catarrh of the posterior nares and pharynx, because of which latter fact no operation was done. Later, however, the patient insisted that she be operated upon; this was done and a solid tumor removed. Two days later death ensued from meningitis. Autopsy disclosed a large basal tumor extending far under the frontal lobes. Pathological diagnosis, sarcoma.

The third case was a man twenty-six years old. For two years he had suffered from intense headaches, visual disorder and vertigo. Examination of the eyes gave a left hemianopsia and an atrophy of the right optic nerve. X-ray showed enlargement of the sella turcica. On operation, the tumor was removed by the usual nasal route, with the result that the headaches were stopped, and subsequent improvement of the optic conditions ensued. Diagnosis, sarcoma.

Referring to operative technic, Eiselsberg used the nasal flap approach with removal of the wall of the frontal sinus, but thinks that Hochenegg's idea would prevent the subsequent deformity, and states that the operation is certainly feasible, especially where the tumor is of a benign character. Care should be taken that the presence of diabetes is eliminated before operation on the tumor, as these two conditions are often dependent upon each other.

THE THORAX.

I. Intra-Thoracic Operations in Positive and Negative Atmospheric Pressure.

H. KÜTTNER (Breslau) reports his experience during the past year in eighteen cases operated on according to the methods of Sauerbruch and Brauer. In nine cases he used the former's method of positive pressure, and in the other nine cases he employed the latter's apparatus for effecting negative pressure. The cases consisted of gunshot wounds, tumors of the chest wall, bronchiectasis, lung fistula, two primary lung cancers, and three carcinomas of the thoracic portion of the œsophagus. In all the cases the author decides that the methods independently of each other, may be employed to a very decided advantage, and tend to show a marked progression in the surgery of this region.

Considered physiologically, both methods seem to have an equal value, but he considers that of Sauerbruch much the more convenient, on account of the increased facilities which it offers to the operator.

ABDOMEN.

I. Gastro-Duodenoscopy and Diaphanoscopy.

TH. ROVSING (Copenhagen) presents this method as an aid in a large number of those cases where the surgeon during the operation, after he has the stomach under direct vision and after thorough inspection and palpation, has not come to any definite diagnosis. The gastroscope is introduced into the stomach through an incision 1 cm. in length on the anterior surface; it is inserted just above the greater curvature and approximately midway between the pylorus and the fundus. It consists of practically a greatly enlarged Nitze gastroscope, but with an apparatus through which air can be introduced for subsequent dilatation. The cut is made small enough so that the instrument, after its introduction, will render the stomach airtight after the application of a purse-string suture arolnd its shank. The procedure consists now of two parts:

First, the diaphanoscopy, and second, the direct gastroscopy. Considering, then, diaphanoscopy: The lamp is lighted as soon as the stomach is sufficiently inflated, the distal end is then moved slowly and methodically over the entire stomach area, on which all the anatomical details of the walls have become astonishingly sharp and distinct; the blood-vessels, the course of the muscle-fibres in the different localities, etc. In order to procure the best results from the illumination it is found best to hold the lamp in the middle of the stomach and to observe its conditions in a perfectly dark or semi-dark operating-room. One can recognize very easily a gastritis from the strong red to deep bluish-red color of the walls, and also by the thickened and distended vascular net-work. Tumors are recognized by the dark, diffuse shadow on the otherwise clear stomach wall. In sharp contrast to this condition, one sees the deep chronic ulcer in the centre of a white, porcelain-like vascular-free portion which is contrasted sharply by a dark red zone. Small erosions or superficial ulcerations of the mucous membrane, if they are bloody or covered with a blood-clot, appear as dark spots on the wall, from which a blood stream may be seen flowing in a dark streak down towards the greater curvature. After the examination of the stomach, the operator may pass the instrument through the pylorus and into the duodenum which is very brilliantly illuminated because of its thinner wall and because of the greater concentration of the illumination.

Second, gastro-duodenoscopy: When one has noticed by diaphanoscopy any abnormal place on the wall of the stomach, this he can then verify by looking through the gastroscope, and so appreciate the exact condition which exists; and in a few minutes he can examine the entire stomach mucous membrane from the cardia to the pylorus, and, further, the pylorus and the duodenum as far as the papilla, when no advanced pyloric stenosis interferes with the passage of the instrument. No abnormality can be concealed on the stretched mucous membrane.

In two cases where from the clinical picture the diagnosis could not be made between carcinoma and ulcer, on examination with this instrument the stomach was found perfectly normal, but severe ptosis was observed and a subsequent gastropexy proved that this was the cause of the symptoms and suffering. In nine cases, ulcers of the stomach were unexpectedly found; in three cases, ulcers of the duodenum were determined as having caused symptoms which were insufficient to determine the exact diagnosis; and in four cases, malignant growths were discovered. In one very important case a patient was undoubtedly saved, from a very severe hemorrhage caused by a very small erosion, which bleeding-place was discovered without danger through the method of diaphanoscopy.

The author also mentioned a specially constructed gastroscope which he used for retrograde introduction into and dilatation of the œsophagus, in cases of stricture which had been found impermeable from above.

The apparatus is easily disinfected by being placed for thirty-six hours in a formalin sterilizer.

In none of the twenty-five cases did peritonitis develop, and only two of the patients—who had advanced cancers—died, of pulmonary complications.